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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,894	11/13/2001	Akira Yonemizu	215872US2	6142

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 01/16/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,894

Applicant(s)

YONEMIZU ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 22-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, claims 1-21 in Paper No. 5 is acknowledged.
2. Claims 22-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Claim Rejections - 35 USC § 102

3. Claims 1, 6 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,433,785 to Saito.
4. Saito discloses an apparatus for processing a substrate in Figure 1, comprising: a heating process chamber (6) in which a heating process is performed for the substrate (11); a load lock chamber (5), connected to the heating process chamber, controlling at least oxygen concentration (via oxygen monitor 15) and pressure (via pump 24); a transferring arm (4) transferring the substrate between the heating process chamber and the load lock chamber; and a gate valve (8) shielding the heating process chamber from the load lock chamber.
5. With respect to claim 6, the apparatus further comprises: a supplier (not numbered, right side of process chamber) supplying an inert gas to the heating process chamber.
6. With respect to claim 8, the load lock chamber of the apparatus further comprises: an opening (houses shutter/gate valve 25) through which the substrate is transferred to/from the outside, and a shutter (25) allowing the opening to be opened and closed.
7. With respect to claim 9, Examiner fails to recognize additional structural limitations.
8. The courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to claims 1, 6 and 8-9 above, and further in view of U.S. Patent No. 5,286,296 to Sato et al further in view of U.S. Patent No. 6,083,566 to Whitesell.

11. Saito discloses the invention substantially as claimed and as described above.

12. However, Saito fails to disclose a first exhausting portion for vacuum exhaustion, a second exhausting portion for normal exhaustion and a selecting portion adaptively selecting the first exhausting portion or the second exhausting portion and causing the selected portion to operate.

13. Sato et al. disclose a load lock chamber comprising a first exhausting portion (12, turbo molecular pump) and a second vacuum exhaustion portion (13, booster pump) (column 4, rows 54-62; column 6, row 58 thru column 7, row 2; column 11, rows 10-15). The first and second exhausting portions connected to a chamber are provided for the purpose of reducing the chamber pressure to different vacuum levels; therefore, the chamber pressure can be set a desired value (abstract). The first and second exhausting portions are capable of reducing the inner pressure of a chamber to 1330 Pa or less (column 4, rows 57-59) and 100,000 Pa or less (column 5, rows 11-16), respectively.

14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided first and second evacuation portions in Saito et al. in order to reduce the chamber to different vacuum levels, thus obtaining the desired chamber pressure as taught by Sato et al.

15. Saito and Sato disclose the invention substantially as claimed and as described above.

16. However, neither Saito nor Sato teaches the use of a selecting portion for adaptively selecting a first exhausting portion or a second exhausting portion.

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17. Whitesell teaches the use of first and second exhausting portions along with a controller for the purpose of controlling the two exhaust portions (column 4, rows 54-62; column 6, row 58 through column 7, row 2; and column 10, rows 50-55).

18. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller for the exhausting portions in the prior art in order to control the exhausting portions as needed as taught by Whitesell.

19. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to claims 1, 6 and 8-9 above, and further in view of U.S. Patent No. 4,389,970 to Edgerton.

20. Saito discloses the invention substantially as claimed and as described above.

21. However, Saito fails to disclose a controller for controlling the temperature of the heating process for the substrate in the heating process chamber. The controller capable of controlling the temperature in the range from 100 degrees C to 800 degrees C.

22. Edgerton teach the use of heating means and a detector for the purpose of controlling circuitry for continuously adjusting the intensity of the heating means to regulate substrate temperature (abstract). The controller is capable of controlling the temperature in the range of 100 degrees C and 800 degrees C (column 7, rows 7-11).

23. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller in Saito in order to regulate substrate temperature as taught by Edgerton.

24. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to claims 1, 6 and 8-9 above, and further in view of Japanese Patent Publication No. 07-142408 A to Nakahigashi.

25. Saito discloses the invention substantially as claimed and as described above.

26. However, Saito fails to teach the apparatus wherein the transferring arm has a temperature adjusting portion adjusting a temperature of the substrate placed thereon.

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27. Nakahigashi teach the use of a heater embedded in transfer means for the purpose of preventing abrupt cooling of a substrate while being transferred (purpose and constitution).

28. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a temperature adjusting portion in the transferring arm in Saito in order to prevent abrupt cooling of a substrate as taught by Nakahigashi.

29. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito as applied to claims 1, 6 and 8-9 above, and further in view of U.S. Patent No. 5,735,961 to Shimada.

30. Saito discloses the invention substantially as claimed and as described above.

31. However, Saito fails to teach a supplier supplying an active gas to the load lock chamber and a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

32. Shimada teaches the use of an oxygen (active gas) supply pipe (Figure 1, 19; supplier) in communication with a gas supply pipe (11; sprayer) supplying oxygen to the load lock chamber connected to a heat process chamber for the purpose of generating a native oxide layer on wafers while loaded in the load lock chamber (column 4, rows 50-64 and column 5, rows 50-54).

33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a supplier and sprayer in the load lock chamber in Saito in order to generate a native oxide layer in wafer while loaded in the load lock chamber as taught by Shimada.

34. Claims 11-13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,433,785 to Saito in view of Japanese Patent Publication No. 07-142408 A to Nakahigashi.

35. Saito discloses the invention substantially as claimed and as described above.

36. However, Saito fails to teach the apparatus wherein the transferring arm has a temperature adjusting portion adjusting a temperature of the substrate placed thereon.

37. Nakahigashi teach the use of a heater embedded in transfer means for the purpose of preventing abrupt cooling of a substrate while being transferred (purpose and constitution).

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38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a temperature adjusting portion in the transferring arm in Saito in order to prevent abrupt cooling of a substrate as taught by Nakahigashi.

39. With respect to claims 12 and 13, which is drawn to the intended uses of the process chamber and transfer arm, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex Parte Masham*, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987).

40. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito and Nakahigashi as applied to claims 11-13 above, and further in view of U.S. Patent No. 5,735,961 to Shimada.

41. Saito and Nakahigashi disclose the invention substantially as claimed and as described above.

42. However, the prior art fail to teach a supplier supplying an active gas to the load lock chamber and a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

43. Shimada teaches the use of an oxygen (active gas) supply pipe (Figure 1, 19; supplier) in communication with a gas supply pipe (11; sprayer) supplying oxygen to the load lock chamber connected to a heat process chamber for the purpose of generating a native oxide layer on wafers while loaded in the load lock chamber (column 4, rows 50-64 and column 5, rows 50-54).

44. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a supplier and sprayer in the load lock chamber in the prior art in order to generate a native oxide layer in wafer while loaded in the load lock chamber as taught by Shimada.

45. Claims 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,433,785 to Saito in view of U.S. Patent No. 5,286,296 to Sato et al. and in view of U.S. Patent No. 6,083,566 to Whitesell.

46. Saito discloses the invention substantially as claimed and as described above.

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47. However, Saito fails to disclose a first exhausting portion for vacuum exhaustion, a second exhausting portion for normal exhaustion and a selecting portion adaptively selecting the first exhausting portion or the second exhausting portion and causing the selected portion to operate.

48. Sato et al. disclose a load lock chamber comprising a first exhausting portion (12, turbo molecular pump) and a second vacuum exhaustion portion (13, booster pump) (column 4, rows 54-62; column 6, row 58 thru column 7, row 2; column 11, rows 10-15). The first and second exhausting portions connected to a chamber are provided for the purpose of reducing the chamber pressure to different vacuum levels; therefore, the chamber pressure can be set a desired value (abstract). The first and second exhausting portions are capable of reducing the inner pressure of a chamber to 1330 Pa or less (column 4, rows 57-59) and 100,000 Pa or less (column 5, rows 11-16), respectively.

49. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided first and second evacuation portions in Saito et al. in order to reduce the chamber to different vacuum levels, thus obtaining the desired chamber pressure as taught by Sato et al.

50. Saito and Sato disclose the invention substantially as claimed and as described above.

51. However, neither Saito nor Sato teaches the use of a selecting portion for adaptively selecting a first exhausting portion or a second exhausting portion.

52. Whitesell teaches the use of first and second exhausting portions along with a controller for the purpose of controlling the two exhaust portions (column 4, rows 54-62; column 6, row 58 through column 7, row 2; and column 10, rows 50-55).

53. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller for the exhausting portions in the prior art in order to control the exhausting portions as needed as taught by Whitesell.

54. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito, Sato et al. and Whitesell as applied to claims 15, 16 and 18 above, and further in view of Japanese Patent Publication No. 07-142408 A to Nakahigashi.

55. The prior art discloses the invention substantially as claimed and as described above.

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56. However, the prior art fails to teach the apparatus wherein the transferring arm has a temperature adjusting portion, adjusting a temperature of the substrate placed thereon.

57. Nakahigashi teach the use of a heater embedded in transfer means for the purpose of preventing abrupt cooling of a substrate while being transferred (purpose and constitution).

58. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a temperature adjusting portion in the transferring arm in the prior art in order to prevent abrupt cooling of a substrate as taught by Nakahigashi.

59. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito, Sato et al. and Whitesell as applied to claims 15, 16 and 18 above, and further in view of U.S. Patent No. 5,735,961 to Shimada.

60. The prior art discloses the invention substantially as claimed and as described above.

61. However, the prior art fails to teach a supplier supplying an active gas to the load lock chamber and a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

62. Shimada teaches the use of an oxygen (active gas) supply pipe (Figure 1, 19; supplier) in communication with a gas supply pipe (11; sprayer) supplying oxygen to the load lock chamber connected to a heat process chamber for the purpose of generating a native oxide layer on wafers while loaded in the load lock chamber (column 4, rows 50-64 and column 5, rows 50-54).

63. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a supplier and sprayer in the load lock chamber in the prior art in order to generate a native oxide layer in wafer while loaded in the load lock chamber as taught by Shimada.

64. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,433,785 to Saito in view of Japanese Patent Publication No. 07-142408 A to Nakahigashi.

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65. Saito discloses the invention substantially as claimed and as described above. Examiner notes that Saito teaches that the concepts of the invention may be applied to single wafer horizontal wafer reaction chambers (column 5, rows 24-31).

66. However, Saito fails to explicitly teach the apparatus wherein a heating plate is disposed in the process chamber, performing a heating process for the substrate.

67. Nakahigashi teaches the use of heating plate (Figure 1, 28; computer translation paragraph 0006) for the purpose of heating a single substrate in a single substrate horizontal processing chamber.

68. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided heating plate in Saito in order to heat a single substrate in a single substrate horizontal processing chamber as taught by Nakahigashi.

69. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito and Nakahigashi as applied to claim 20 above, and further in view of U.S. Patent No. 6,083,566 to Whitesell.

70. Saito and Nakahigashi disclose the invention substantially as claimed and as described above.

71. However, neither Saito nor Nakahigashi teach the use of a controller for controlling the supplier and the pressure reducing portion.

72. Whitesell teach the use of a controller for the purpose of controlling the various elements of a vacuum heat processing apparatus (column 4, rows 54-62; column 6, row 58 through column 7, row 2; and column 10, rows 50-55).

73. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller in the prior art in order to control the various elements of a vacuum heat processing apparatus as taught by Whitesell.

Conclusion

74. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

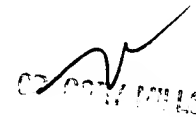
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
January 9, 2003


GREGORY MILLS
SUPERVISOR
TECHNICAL CENTER 1763